

WHAT IS CLAIMED IS:

1. A current to voltage conversion circuit employing a gain switching circuit, comprising:

5 a photoelectric conversion device for receiving an optical signal and generating current corresponding thereto;

10 current source current mirror means connected between a drive voltage and said photoelectric conversion device for supplying the same amount of current as that of the current generated by said photoelectric conversion device;

an amplifier for receiving a current signal and outputting a voltage signal corresponding thereto;

15 read current mirror means for transferring the current from said current source current mirror means to an input terminal of said amplifier in response to a switching control signal;

20 write current mirror means for transferring said current from said current source current mirror means to said input terminal of said amplifier in response to said switching control signal;

switching means for selectively turning on said read current mirror means and said write current mirror means in response to said switching control signal; and

25 a feedback resistor connected between said input terminal of said amplifier and an output terminal of said amplifier.

2. The current to voltage conversion circuit as set forth in claim 1, wherein said current source current mirror means includes:

a source transistor connected to said drive voltage;  
5 and

first and second target transistors, each of said target transistors allowing the same amount of current as that of current flowing through said source transistor to flow therethrough.

10 3. The current to voltage conversion circuit as set forth in claim 1, wherein said read current mirror means includes:

a read connection transistor for transferring said current from said current source current mirror means to  
15 said amplifier;

a read current source transistor for receiving current from said switching means to turn on said read connection transistor;

a first read emitter resistor connected to an emitter  
20 of said read current source transistor; and

a second read emitter resistor connected to an emitter of said read connection transistor.

4. The current to voltage conversion circuit as set forth in claim 3, wherein said read current mirror means  
25 further includes an auxiliary read current source transistor connected between a base of said read current source transistor and a collector thereof.

5. The current to voltage conversion circuit as set forth in claim 1, wherein said read current mirror means includes:

5 a read connection transistor for transferring said current from said current source current mirror means to said amplifier;

a read current source transistor for receiving current from said switching means to turn on said read connection transistor; and

10 a read emitter resistor connected to an emitter of said read current source transistor.

6. The current to voltage conversion circuit as set forth in claim 1, wherein said read current mirror means includes:

15 a read connection transistor for transferring said current from said current source current mirror means to said amplifier;

a read current source transistor for receiving current from said switching means to turn on said read connection transistor; and

20 a read emitter resistor connected to an emitter of said read connection transistor.

7. The current to voltage conversion circuit as set forth in claim 1, wherein said write current mirror means includes:

25 a write connection transistor for transferring said current from said current source current mirror means to said amplifier;

a write current source transistor connected to said write connection transistor for receiving current from said switching means to allow current to flow to said write connection transistor by virtue of mirroring;

5           a first write emitter resistor connected to an emitter of said write current source transistor; and

          a second write emitter resistor connected to an emitter of said write connection transistor.

10           8. The current to voltage conversion circuit as set forth in claim 7, wherein said write current mirror means further includes an auxiliary write current source transistor connected between a base of said write current source transistor and a collector thereof.

15           9. The current to voltage conversion circuit as set forth in claim 1, wherein said write current mirror means includes:

          a write connection transistor for transferring said current from said current source current mirror means to said amplifier;

20           a write current source transistor connected to said write connection transistor for receiving current from said switching means to allow current to flow to said write connection transistor by virtue of mirroring; and

25           a write emitter resistor connected to an emitter of said write current source transistor.

          10. The current to voltage conversion circuit as set forth in claim 1, wherein said write current mirror means includes:

a write connection transistor for transferring said current from said current source current mirror means to said amplifier;

5 a write current source transistor connected to said write connection transistor for receiving current from said switching means to allow current to flow to said write connection transistor by virtue of mirroring; and

a write emitter resistor connected to an emitter of said write connection transistor.

10 11. The current to voltage conversion circuit as set forth in claim 1, wherein said switching means includes:

a read switching transistor turned on in response to said switching control signal in a read mode;

15 a write switching transistor turned on in response to said switching control signal in a write mode;

a first switching resistor connected between a switching control signal input terminal and a base of said read switching transistor;

20 a second switching resistor connected between said drive voltage and said base of said read switching transistor;

a first voltage-dividing resistor connected between said drive voltage and a base of said write switching transistor; and

25 a second voltage-dividing resistor connected between said first voltage-dividing resistor and a ground terminal.

12. The current to voltage conversion circuit as set forth in claim 11, wherein said first switching resistor,

second switching resistor, first voltage-dividing resistor and second voltage-dividing resistor have resistances set to turn on said read switching transistor and turn off said write switching transistor, when said switching control signal is 0V.

13. The current to voltage conversion circuit as set forth in claim 11, wherein said second switching resistor has a resistance which is four times that of said first switching resistor.

14. The current to voltage conversion circuit as set forth in claim 11, wherein said first voltage-dividing resistor and said second voltage-dividing resistor have the same resistances.